



The Global Governance Architecture of Nuclear Security

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Recommendations

- Nuclear security is a sovereign responsibility. Individual state determination of adequate nuclear security standards and national implementation of the standards is not enough. Therefore, strengthened international standards and accountability are required on early detection; prevention of attacks, thefts, and sabotage; and recovery of missing nuclear material.
- Sovereignty should be reframed to emphasize state responsibility and accountability to citizens and the international community rather than state prerogatives.
- Summits produce diminishing returns. The Nuclear Security Summit (NSS) was always envisaged as an ad hoc and temporary mechanism, not a permanent institution. The summit communiqués and other documents already make the political commitment to nuclear security measures, and it is neither practical nor desirable to keep bringing large numbers of world leaders together to announce minor incremental steps toward the already agreed on goal. The 2014 summit should be the last and pursue a three-part, high-level policy objective:
 - To have a high degree of confidence in the nuclear security standards, arrangements, and practices.
 - To build a unified and cohesive nuclear security architecture that is robust, resilient, and rugged; that prioritizes and emphasizes weapon-usable fissile material protection but also embraces radiological sources and security culture; and that nests nuclear security in the other nuclear regimes dealing with peaceful uses, nonproliferation, and disarmament.
 - To structure incentives and disincentives in such a way as to shift the balance of standards, arrangements, understandings, and practices toward threat elimination and risk minimization.
- As the world's premier nuclear regulator, the IAEA must be mandated to negotiate binding agreements that establish global nuclear security standards and be given the authority and the responsibility to certify compliance with these standards by monitoring national implementation.
- To overcome the efficiency-legitimacy gap and the North-South divide, after the final summit, agreements should be brokered in other appropriate multilateral groupings, like the G-8, G-20, and BRICS, and then these deals should be validated by the UN system as the mandated multilateral system.
- The full and active involvement of all stakeholders, including nuclear industry and civil society, should be encouraged as it is key to overcoming a government-governance gap and strengthening nuclear security.

The Nuclear Non-Proliferation Treaty was signed in 1968 and went into force in 1970. It is rightly regarded as the most successful arms control agreement in history. Its three main pillars are nuclear disarmament, nuclear nonproliferation, and peaceful uses of nuclear energy. Since the terrorist attacks of September 11, 2001, nuclear security concerns have been heightened owing to several developments: fears that terrorist groups with cadres of suicide bombers not deterred by the thought of their own deaths are interested in acquiring nuclear weapons radioactive and fissile material, or in attacking nuclear facilities; revelations of illicit trafficking in nuclear materials, components, and technology; unresolved security vulnerabilities at nuclear facilities in Russia and some other former Soviet republics; and several nuclear incidents in recent times.

In his visionary speech in Prague on April 5, 2009, President Barack Obama announced the start of “a new international effort to secure all vulnerable nuclear material around the world within four years.”¹ The justification was to reduce the risk of nuclear terrorism, described as both the most immediate and extreme threat to global security. This paper will first state the problem, then describe global governance of nuclear security, including components of the UN system, bilateral US-Russia and other cooperative arrangements, and the nuclear security summits. In the third part, it assesses the state of nuclear security governance against four global governance disconnects.

The Problem

Terrorists need only to identify and exploit the weakest link in the chain of international nuclear security to acquire enough fissile material to make and detonate a bomb in a major city. According to the International Atomic Energy Agency (IAEA), between 1993 and 2011, there were more than 2,000 cases of illegal trafficking, theft, or loss of nuclear and radiological materials around the world, of which only 40 percent has been recovered.²

In South Africa, there have been several cases of infiltration of the Pelindaba nuclear research facility outside Pretoria. The site, where the apartheid government conducted nuclear weapons research and production, and which gave its name to Africa’s nuclear-weapon-free zone in 1996, is believed to store enough weapon-grade material for up to 25 nuclear bombs.³ In 2005, a portable computer was stolen from there. In November 2007, two groups of armed men broke into it from different directions, deactivated several layers of security, penetrated the control room for 45 minutes, and escaped, but without taking any nuclear material. In April 2012, a third violation of protective measures at the facility was described as an act of “common” crim-

inality. The national nuclear regulator spokesperson, Gino Moonsamy, was quoted as saying that thanks to “adequate physical protection, no nuclear or radioactive material was accessed, lost or stolen.”⁴ The hundreds of pounds of weapon-grade highly enriched uranium (HEU) “being held there may be stored in “locked down” secure conditions, but the number of breaches of the site has to be of concern.

Pakistan is often dubbed the most dangerous place on earth because of the lethal cocktail of an unstable military-dominated regime, Islamist groups bitterly hostile to the West, terrorists, and nuclear weapons. Serial attacks have done little to dispel international fears over “the risk of terrorists breaching Pakistan’s defenses.”⁵ On August 16, 2012, several gunmen wearing military uniforms and suicide vests attacked the Minhas base of the Pakistan air force 40 miles northwest of Islamabad.⁶ In September 2012, the Inter-Services Intelligence reportedly intercepted plans by the Tehreek-e-Taliban Pakistan to attack one of the country’s largest nuclear facilities in Dera Ghazi Khan, described by a military officer as “the first-ever serious security threat” from the terrorist group.⁷

Charles Ferguson, president of the Federation of American Scientists, claims that in the United States, “a radioactive source is lost, stolen or missing about once a day,”⁸ albeit only a small proportion is of any security or public health concern. In a by-now-notorious incident, on August 29, 2007, a B-52 bomber carrying six air-launched cruise missiles armed with nuclear warheads made an unauthorized flight from North Dakota to Louisiana.⁹ The United States is supposedly secure compared to Russia or Pakistan. In January 2008, in a hilarious, tongue-in-cheek press conference, Pakistan’s military spokesman, Brigadier General Atta M. Iqbal, pointed to US command and control being lax relative to Pakistan, the history of US nuclear accidents, the record of US proliferation to allies Britain and France, a commander in chief who confessed to having been an alcoholic, and the fundamentalism and religious fervor of the American people and administration. The Pakistani general even offered technical advice and assistance to the United States to improve its nuclear weapons-handling procedures, to which Pentagon officials responded stiffly that the US role was to give, not receive, advice on nuclear weapons safety and security issues.¹⁰

It is possible to interpret the illustrative catalog of incidents in two ways. The first is to argue that it is unnecessarily alarmist and exaggerates the importance of the incidents, for none of them has actually led to anything consequential. Recalling them is equivalent to crying wolf, alerting the international community to a nonexistent danger. The alternative conclusion is that significant risks are inherent in this sphere. Authorities have to be vigilant and succeed in preventing theft and attacks every single time. True, so far all alarms have

been detected in time, and none has led to a major incident, let alone a catastrophe. Unfortunately, this is no guarantee of good luck holding always and forever: the boy who cried wolf did indeed get killed and eaten by a wolf.

The incidents show the urgent need to raise international nuclear security standards. The objective of nuclear security is to ensure that nuclear weapons and radioactive materials are secure from unauthorized access and theft, the facilities in which they are manufactured and stored are secure from sabotage, and terrorists and other criminals are prevented from acquiring, making, and using nuclear explosive devices. Nuclear terrorism is a subset of nuclear security and falls into the low-probability, high-impact category of global threats. It remains difficult to accomplish, but the potential consequences are such that it must be taken seriously.

The basic knowledge and skill to make a crude nuclear explosive device is readily available and acquired. It is far more challenging to produce weapon-grade fissile material—HEU or separated plutonium—on any substantial scale. Only states are likely to have the necessary level of infrastructure. But if their material, facilities, and personnel have security vulnerabilities, then the nuclear material or even a nuclear bomb could be stolen. Those seeking it will raid not the facility or the country with the most nuclear material, but that which is the most vulnerable. Any country could be a target; all could feel the effects. This is why measures for the physical protection of all nuclear materials, facilities, and activities are essential and critical components of international nuclear security. As well as guards, gates, and fences at nuclear plants and facilities, this requires thorough background checks on personnel employed there and rigorous training after recruitment in order to inculcate a culture of nuclear security.

HEU is “the most accessible fissile material for a terrorist nuclear device.”¹¹ It has a threefold attraction for terrorists: it can be used in the simple “gun-type” fission weapon with no need for sophisticated detonation equipment; it is smuggler-friendly because it emits only faint radiation signals that make it hard to detect; and, being less radiotoxic than plutonium, it is safer to handle. The bulk of HEU in the world is used for military purposes, but significant amounts are also used in civilian programs. Almost 1,700 metric tons of weapon-grade nuclear materials in the world—enough for 100,000 bombs, compared to the present stockpiles of under 18,000—are stored in hundreds of sites in 32 countries.¹² This is in addition to an estimated 111 sites spread across 14 countries in which nuclear weapons are stored.¹³ While some of the sites are well-secured, many are not, hence the risk of sabotage and theft by, or illicit sales to, terrorists or other criminals. Materials used in the nuclear fuel cycle can be lost, abandoned, or removed from decommissioned and inactivated

facilities without proper authorization. The risks are multiplied in conditions of fragile and failing states, of fragmented authority structures, of a pervasive culture of corruption among public officials, or when widespread unemployment and poverty can weaken resistance to inducements offered by various groups.

HEU stocks should be eliminated where feasible or minimized and consolidated into fewer sites. Over half the world total of weapon-grade material is in Russia. There are no precise and reliable figures on how much HEU or separated plutonium is missing. The elements of a perfect nuclear security storm are the abundant supply of weapon-usable nuclear materials; the explosion of knowledge and technical expertise, much of it relatively easily accessed through the Internet; the determination of terrorists to get it; and the known ruthlessness of terrorists to use it.

In order to limit opportunities for theft and sabotage, states must restrict access to nuclear material and facilities only to authorized personnel, and to the minimum number of personnel consistent with safe operational requirements; keep material that is not in use in secure vaults; and monitor all storage and access of materials. Physical protection systems should be subject to periodic inspection and testing. Accountability mechanisms include an appropriate legislative and regulatory framework, a competent and independent oversight authority or nuclear regulator, and a clear assignment of responsibilities for nuclear security and safety.

Global Governance Architecture

Global governance consists of formal and informal arrangements that provide more order and stability than would occur otherwise. The *content* of global governance embraces the totality of laws, norms, policies, and institutions that define, constitute, and mediate relations between citizens, societies, markets, and states in the international system—the wielders and objects of the exercise of international public power. The *architecture* of global governance is made up of formal international organizations, with the United Nations system as the core of the organized multilateral order; formal regional and subregional organizations; informal general-purpose groupings, of which the most visible example in recent times is the G-20,¹⁴ but which also include the G-7/8 and BRICS (Brazil, Russia, India, China, and South Africa);¹⁵ informal and single-problem institutions like the Proliferation Security Initiative and the NSS; and transnational civil society and market actors.

The Mandated Multilateral System

The main global components of the nuclear security regime centered on the UN system are:

- The Convention on the Physical Protection of Nuclear Material (CPPNM)

- The CPPNM Amendment.
- The International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT).
- UN Security Council Resolution 1540.
- IAEA activities and documents.

The CPPNM, signed in 1980 and in force since 1987, establishes measures related to the physical protection of nuclear material during international transport and a general framework for cooperation among states in the protection, recovery, and return of stolen nuclear material. The 2005 amendment extends obligations to the protection of nuclear facilities and material in peaceful domestic use, storage and transport, and also provides for expanded international cooperation on measures to locate and recover stolen and smuggled nuclear material, and to mitigate any radiological consequences of sabotage.

ICSANT, adopted in 2005 and in force since 2007, seeks to protect against attacks on nuclear targets, punish the perpetrators through domestic criminalization of acts of nuclear terrorism, and promote international cooperation in the prevention and investigation of acts of nuclear terrorism and the prosecution and extradition of the alleged terrorists. To facilitate the “prosecute or extradite” regime, these offenses are explicitly described as “nonpolitical” so that the defense of any of these acts being a political offence is not available to block extradition.

UN Security Council Resolution 1540 affirmed proliferation of weapons of mass destruction (WMD) as a threat to international peace and security and expressed concern over the threat of WMD terrorism and of illicit trafficking in WMD material, weapons, and delivery systems. It obligates all states to criminalize getting, using, and transferring WMD to nonstate actors, and to take and enforce effective domestic control, physical protection, accounting, and border-control measures to prevent proliferation to nonstate actors, and prohibit assisting or financing such proliferation. All states are expected to report on the progress of their implementation; 176 of 193 UN member states had submitted reports by December 2012.

The IAEA is the lead international organization for the safe, secure, and peaceful use of nuclear energy, science, and technology. It pursues a three-pronged strategy to combat nuclear risks: prevention of illicit and nonpeaceful use of nuclear material; the timely detection of any such efforts; and swift and decisive recommendations to the UN Security Council when nuclear risks are apparent. Because nuclear security is a more recent concern than the three established legs of peaceful uses of nuclear energy, nonproliferation, and disarmament, it has not been a priority item in the

distribution of funding and agenda for the agency. Yet even in nuclear security, the IAEA has taken a lead role, if by default, because of its technical expertise, institutional credibility and legitimacy, and the lack of practical alternatives.

The IAEA offers advisory and peer-review services on nuclear security to member states on request and has helped them to develop integrated plans for nuclear security improvements and assistance. Its International Physical Protection Advisory Service missions offer one example of a peer-review mechanism. Since the first one in 1996, 56 missions have been performed in 37 countries.¹⁶ In its Nuclear Security Series, INFCIRC/225/Revision 5 (2011)—a set of nonlegally binding guidelines—is the cornerstone of the international physical protection regime for nuclear materials and facilities; it has been incorporated in the domestic law of many states, and also in many suppliers’ bilateral agreements, as a condition of peaceful nuclear cooperation. The US “123” (so-called because it is pursuant to Section 123 of the US Atomic Energy Act) civil nuclear cooperation agreement with the United Arab Emirates is a good example of this. Australia, Canada, and the European Atomic Energy Community countries have similar bilateral agreements.

The IAEA’s Code of Conduct on the Safety and Security of Radioactive Sources applies to the development and harmonization of policies, laws, and regulations on the safety and security of radioactive sources from initial production to final disposal; that is, also to radioactive wastes not covered by the CPPNM. The IAEA has operated the Illicit Trafficking Database Program since 1995 as an information system on incidents of illicit trafficking and other unauthorized activities and events involving radioactive material. Other IAEA activities include performing analyses of confiscated samples, assisting states with border controls, testing detection and monitoring equipment, and conducting training courses.¹⁷

Nuclear forensic analysis is another key technical capability. Experts in the IAEA Office of Nuclear Security trace the “signatures” of each of the production processes in the manufacture of nuclear material by analyzing the chemical constituents and physical properties to determine the geological features of the place from which the uranium ore might have been extracted, or the process by which it was concentrated into yellowcake, made into nuclear fuel pellets, and burned in a reactor. By determining that the illicit material originates from a particular country, nuclear forensics can highlight the need to improve its nuclear security regime.

Extra-UN Cooperative Arrangements

Since the Cold War, the United States has implemented a series of programs and projects, much of it in the former Eastern bloc countries, to reduce the risk that nuclear and radioactive materials would escape from

safe custody.¹⁸ In 2004, a number of projects were consolidated into the Global Threat Reduction Initiative under the management of the Department of Energy, and these have reduced and protected vulnerable nuclear and radiological material worldwide by a combination of reactor conversion, removal of material, and physical protection. The Department of Defense managed the implementation of the Cooperative Threat Reduction (Nunn-Lugar) program, begun in 1991–92, that was primarily intended to facilitate arms reductions in the framework of START I but included elements relevant to nuclear security. The projects helped Russia consolidate nuclear warheads and fissile material in military stocks in safe and secure facilities. The Global Partnership Against the Spread of Weapons and Materials of Mass Destruction, launched at the 2002 G-8 Summit in Kananaskis, Canada, and the Global Initiative to Combat Nuclear Terrorism, set up by Presidents George W. Bush and Vladimir Putin in St. Petersburg, Russia, on July 15, 2006, are other examples of cooperative efforts to enhance global nuclear security and strengthen protection against nuclear terrorism.

In July 2012, the US National Nuclear Security Administration announced that it had monitored the elimination of more than 450 metric tons of Russian HEU under the 1993 US-Russia HEU Purchase Agreement. This agreement is a leading example of the practice of “down-blending” weapon-grade HEU into low-enriched uranium for commercial energy use. The Russian weapon-grade HEU is fabricated into nuclear fuel and used in nuclear power plants to generate about 10 percent of US consumer electricity, or nearly half of all commercial nuclear energy produced in the United States. The “megatons-to-megawatts” agreement is now 90 percent complete and on track for the conversion of the total of 500 metric tons of Russian nuclear weapons HEU to low-enriched uranium by the end of 2013, when the National Nuclear Security Administration will have monitored the elimination of HEU equivalent to about 20,000 nuclear weapons.¹⁹ Progress has also been made in the global efforts to eliminate excess weapon-grade plutonium, including under the US-Russia Plutonium Management and Disposition Agreement, which was signed in 2000, amended in 2010, went into force in 2011, and will commence disposing of surplus plutonium in 2018.

Nuclear Security Summits

Two nuclear security summits have been held, in April 2010 in Washington, DC, and in March 2012 in Seoul. A third, and probably last, summit is planned for 2014 in the Netherlands. They were convened to strengthen, consolidate, elevate, and energize the many existing national, multilateral, and cooperative institutions and structures to fortify nuclear security. They are important for having affirmed US presidential leadership and elevating the issue to the level of a global leaders’

summit. The two summits to date reaffirmed the international treaties, instruments, and institutions that backstop national efforts to strengthen nuclear security and prevent nuclear terrorism. But both summits took care to reaffirm the rights of states to develop and utilize nuclear energy for peaceful purposes.

In January 2012, the Nuclear Threat Initiative published a benchmark study, *The Nuclear Materials Security Index*.²⁰ The analysis was based on five categories (quantities and sites, security and control measures, global norms, domestic commitments and capability, and societal factors like political stability and corruption), which were subdivided into 18 indicators that went beyond “guns, guards and gates” and also beyond nuclear materials control and accountability practices. The study concluded that although governments have become more aware of the threats, there is still no global consensus on the most important steps to achieve nuclear security; state accountability is problematic because of lack of transparency; stocks of weapon-usable materials continue to rise in some countries; almost a quarter of the states scored poorly on societal factors; and many lag on joining international agreements. The index was complemented by an assessment of national commitments that concluded that of the more than 60 national commitments made by 30 participants at the 2010 summit, 80 percent had been completed by the Seoul 2012 summit.²¹ However, progress on some promises is impossible to measure because they are not quantifiable and are hedged with many qualifiers.

Global Governance Anomalies and Disconnects

“Global governance,” which became popular as a state-of-the-art term only in the 1990s, is an unfinished journey owing in part to four significant disconnects: between global problems-cum-solutions and state sovereignty; between the robustness of global challenges and the speed with which they arise and the slow, hesitant, and feeble institutional responses to them; between legitimacy and efficiency, and the differing balance between the two struck by countries of the global North and South; and between those with the formal authority to make decisions and the growing numbers, role, and credibility of nonstate actors from civil society and the market.²²

Problems Without Passports,²³ Solutions Subject to Passports

Of the five analytical gaps whose narrowing and widening explain the advance and retreat of global governance,²⁴ compliance gaps (implementation, monitoring, enforcement) are the most problematic and result from the anomaly of the organizing principle being sovereign statehood when critical threats have long escaped border controls. International order rests

on a system of global governance without world government. The most pressing problems are global in scope and require global solutions and the globalization of the process of policymaking. But the threats to peace and security lie within rather than between states, and the policy authority and resources for tackling them remain vested in states that guard their sovereignty zealously.

Thus, the force of the two NSS outcome documents was weakened by the fact that they were vague, nonbinding, and full of escape clauses like “as appropriate,” “where technically and economically feasible,” “taking into account the need for assured supplies of medical isotopes,” and “consistent with national security considerations and development objectives.” In December 2012, the CPPNM had 148 states as parties, so around one-quarter of the world’s countries still have not acceded to it;²⁵ the CPPNM Amendment had only 61 of the 96 required number of accessions to enter into force; while just 83 nations had ratified ICSANT.²⁶

This explains the contradiction between the high compliance rate of NSS-participating states, as recorded by the Arms Control Association, and the conclusion, “Four years ago, President Barack Obama called preventing nuclear terrorism a top security priority, but the United States is only marginally safer from that threat today.”²⁷

Several regimes have been refined and additional ones promulgated to treat nuclear security as a matter subject to both domestic and international law; to require states to use and, if necessary, strengthen domestic legal systems to fight nuclear terrorism; to use international law as a basis, and the United Nations as a key forum, for international collaboration and action to meet the threat of nuclear terrorism; and to encourage and facilitate interstate cooperation in meeting the challenge in other ways. However, the development and widespread adoption of international best practice in nuclear security culture is inhibited by concerns over national sovereignty if multilateral standards are made more stringent and international institutions are given expanded authority to enforce compliance.

Hinderstein, Newman, and Reistad have argued that the time has come to move from HEU minimization to elimination.²⁸ Although significant progress has been made on reducing the number of and securing fissile material storage sites, and in conversion of HEU to low-enriched uranium, states have been reluctant to ban HEU use in civilian applications. It is difficult to see this happening in the foreseeable future with states fiercely protecting national sovereignty, the United States being second to none on this. States, led by the major powers, are even more jealous of their sovereignty with respect to military security. In the global stockpile of weapon-usable material, almost all HEU and about half of the plutonium remain outside civilian programs.²⁹

Thus only a small fraction of the world’s HEU and less than half of the world’s separated plutonium is subject to international discipline with respect to nuclear material accountancy. HEU fuel use for powering submarines and aircraft carriers in the navies of the world poses a further challenge. Some progress is evident in the removal of fissile material no longer required for military purposes from nuclear weapons programs, and in the decommissioning and dismantling of weapon-grade fissile material production plants. The challenge remains to devise systems and procedures that secure noncivilian nuclear material and facilities “to international standards, guidelines, best practices, or mechanisms for international assurance”³⁰ without downgrading national security.

Noncivilian nuclear material under military protection is generally better protected than civilian material. But not all material and facilities under military protection can be assumed to be totally safe, and not all nuclear material for noncivilian use is under military protection. Warhead components, warheads undergoing maintenance or awaiting dismantlement, and the large stockpiles of US legacy material, for example, are in the custody of the Department of Energy and under the protection of civilian contractors. On July 28, 2012, in what may have been “the biggest security breach in the history of the nation’s atomic complex,”³¹ three activists—including an 82-year-old nun—broke into a heavily guarded section of the Y-12 National Security Complex in Oak Ridge, Tennessee, that houses several hundred tons of weapon-grade HEU and had been assumed to be secure against armed terrorists. This is a government but not a military facility.

The tension between state sovereignty and international peace, discussed mainly in the context of the Responsibility to Protect doctrine,³² is relevant here also. Nuclear security is a sovereign responsibility. But a major nuclear security vulnerability or crisis anywhere would pose an unacceptable risk and threat everywhere, and therefore all countries have an interest in the effectiveness of the global nuclear security regime. Individual state determination of adequate nuclear security standards and national implementation of the standards is not enough. Therefore, strengthened international standards and accountability are required on early detection; prevention of attacks, thefts, and sabotage; and recovery of missing nuclear material. Securing the world’s most dangerous materials is the universal responsibility of all states and a common responsibility to all humankind.

The protection agenda of the Responsibility to Protect principle-cum-norm is not relevant to nuclear security, as it is restricted to mass atrocities. But the sovereignty as responsibility doctrine is fully applicable: there is no reason at all to restrict its scope in principle just to atrocity crimes. Reframing sovereignty by relegating

state prerogatives and emphasizing state duties instead implies that, in the social contract that imposes obligations on citizens to comply with authoritative state demands, states are responsible for providing all the public goods, including physical safety from threat within state borders and national security against foreign threats; responsible to citizens and the international community of states as a collective body for fulfilling the duties of statehood in domestic governance and international discourse; and they can be held responsible, that is accountable, by citizens domestically and by the international community globally. When national acts of omission and commission have global systemic consequences—whether with respect to financial disasters, atrocity crimes, or nuclear issues of safety, security, safeguards, doctrine, use, proliferation, and disarmament—determining the balance between state sovereignty and international responsibility is not solely a prerogative of states: the international community does have a voice and should have a vote, if not a veto.

Robust Global Challenges, Slow and Feeble Institutional Responses

The evolution of international institutions to facilitate cooperation and mute conflict lags behind the rise of collective action problems with cross-border dimensions. With the institutions that do exist, there is often a significant gap between demonstrated and supposedly agreed needs, norms, and policies on the one hand, and the resources available to global problem-solving institutions on the other hand. Thus there is a big gap between the exalted expectations of what the IAEA can accomplish and the modest resources given to it.

The NSS as a single-issue institutional response to this specific problem had two unusual features: it was brought about with exceptional promptness, and it engaged the heads of government directly at the very apex of public diplomacy. Unlike the G-20, which is the world's premier economic forum for leaders but which emerged primarily as a crisis-response mechanism of global governance, the NSS is an example of a crisis-prevention global governance mechanism.

Summits are made possible because of advances in transport and telecommunications, which also facilitate the active participation of civil society networks and their role as watchdogs of government performance.³³ Summits are necessary because of the growing interdependence among nations and interconnectedness among issues that cut across ministries and responsibilities and require collective management at the highest levels. Like international finance and trade, pandemics and terrorism, climate change and biodiversity, nuclear security too spills across national boundaries.

However, not all topics lend themselves equally well to summit diplomacy, not all summits are successful, and

not all successful summits or topics are suitable for ongoing institutionalization. Summits should make the most difference in those problem areas where leadership commitment is the critical variable (the discipline of “the pay grade test”³⁴), where the primary obstacle to identifying policy overlap and convergence and reaching consensus is the unavailability or inadequacy of an appropriate forum, and where speedy resolution is essential. Conversely, if the chief impediment is a fundamental clash of interests and the issues in dispute are technical more than political, then a fresh institutional setting is not the answer to the lack of common interest that can override national or sectional differences.

Unlike cabinet ministers with single portfolio responsibilities, leaders must oversee the broad agenda and interrelationships across issues and domains, domestic and international, political and economic, governments and markets. Their engagement catalyzes officials to focus on and resolve interagency differences, jurisdictional turf battles, and veto points before the summit. At the summit, their involvement makes it possible for states to bargain across issues in order to cut deals (that is, trade apples for oranges). Among leaders, summit agreements can result in diffuse reciprocity: not tit-for-tat bargaining but rather a general atmosphere where the interests of counterparts are carefully considered across a range of issues. After the summit, their commitment to the agenda invests it with legitimacy, prioritizes its implementation, and can help to redirect resources even amid fiscally constrained budgetary environments.

In sum, with broad, overarching responsibilities, leaders—and only leaders—can best weigh priorities and seek to balance interests across competing goals, sectors, national and international objectives, and between the immediate, medium, and long terms.³⁵ According to former Canadian Prime Minister Paul Martin, an appropriately structured and adequately prepared summit “should get political leaders doing what they alone can do—making tough choices among competing interests and priorities.”³⁶

In powerful testimony to the value added by summit diplomacy, the extent of voluntary reporting by states at the Seoul NSS in 2012 on the compliance of their nuclear security systems with commitments made at the 2010 NSS was higher than under the legally binding international instruments.³⁷ The CPPNM was already adhered to quite widely (but not universally) before the first NSS. Since then, 23 more states became parties to the CPPNM Amendment, and those acceding to ICSANT have increased by about one-quarter, with 14 additions.

Summits produce diminishing returns. The NSS was always envisaged as an ad hoc and temporary mechanism, not a permanent institution. Yet once established, summits can generate their own inertia. The

NSS will be exceptional if after the third one in the Netherlands in 2014, it draws to a close. The summit communiqués and other documents already make the political commitment to nuclear security measures, and it is neither practical nor desirable to keep bringing large numbers of world leaders together to announce minor incremental steps toward the already agreed goal.

As the NSS process concludes, the 2014 summit should be animated by a three-part, high-level policy objective:

- To have a high degree of confidence in the nuclear security standards, arrangements, and practices.
- To build a unified and cohesive nuclear security architecture that is robust, resilient, and rugged; that prioritizes and emphasizes weapon-usable fissile material protection but also embraces radiological sources and security culture; and that nests nuclear security in the other nuclear regimes dealing with peaceful uses, nonproliferation, and disarmament.
- To structure incentives and disincentives in such a way as to shift the balance of standards, arrangements, understandings, and practices toward threat elimination and risk minimization.

Will there be life for the nuclear security agenda after 2014? There is a serious issue of how to sustain the necessary commitment. One option would be for the IAEA—the only existing international organization with a (limited) nuclear security mandate—to leverage its institutional credibility, integrity, and legitimacy, based on near-universal membership and technical expertise, to take over the NSS agenda. Its work on nuclear security has been given greater prominence, visibility, and importance since the 2010 summit. Its dedicated office on strengthening nuclear security provides global leadership as well as invaluable technical information, guidance, training, and assistance. But it lacks authority to establish mandatory baseline standards for nuclear security and to monitor and enforce compliance with the standards. Regular, independent international review of safety, security, and safeguards measures should be the international norm. As the world's premier nuclear regulator, the IAEA must be mandated to negotiate binding agreements that establish global nuclear security standards and given the authority and the responsibility to certify compliance with these standards by monitoring national implementation.

That said, it is difficult to visualize states agreeing to give the IAEA mandatory and intrusive authority and powers in the foreseeable future. Another possibility is the negotiation of a framework convention on nuclear security,³⁸ similar to the UN Framework Convention on Climate Change, that would bring together the existing disparate and loosely defined nuclear security conven-

tions, rules, and standards. The Fissile Materials Working Group believes that a framework convention would solve the problem of the “patchwork of voluntary, nonbinding, nontransparent national commitments, ad hoc bilateral and multilateral initiatives, and vague legally binding measures” without specific standards that currently exists.³⁹ The IAEA could be made the convention's executive agent to monitor and assess national implementation of the international standards and requirements. As already indicated, the best solution is to empower and fully capacitate the IAEA instead of pursuing a framework convention.

However, given the reputational damage to the Framework Convention on Climate Change at and since the Copenhagen conference, an explicit parallel may not be politically wise. A Nuclear Threat Initiative-sponsored global dialogue on nuclear security has concluded that while legally binding mechanisms may be desirable in the future, the search for it now, when no consensus for it exists, is likely to delay urgently needed security upgrades that are feasible within voluntary mechanisms.⁴⁰ Thus, the negotiation of a new legal mechanism or convention does not appear to be an immediate priority.

The Efficiency-Legitimacy Gap and the North-South Divide

During the Cold War, the main axis around which world affairs rotated was East-West. Since the end of the Cold War, this has morphed into a North-South axis.⁴¹ While the former often pushes for improved efficiency and justifies the more compact groupings like the G-7/8 on this basis, the latter insists on inclusiveness and representation as the price of international legitimacy. Over the past decade, this pathology has been cross-infected with a second development. There is a growing gulf between the distribution of authority in the artificially constructed world of international intergovernmental institutions and the international distribution of military and market power and political clout. The approaches of Asia, in general,⁴² and China, in particular,⁴³ to managing and reforming the global governance architecture become especially important. In the emerging new architecture, the old global political imbalances need to be readjusted to the new global economic imbalances.

Most developing countries put higher priority on their own pressing concerns of poverty alleviation and economic development. Some countries fear that the nuclear security agenda is a trap by the industrialized countries to deny them scientific and technological advances. Others remain unconvinced of the urgency to remove or eliminate HEU stockpiles. Nonnuclear weapon states provide confidential reporting on HEU stocks under IAEA safeguards agreements. But there is no binding transparency or public declarations regime of HEU holdings, military nonexplosive stockpiles,

inventories of material resulting from nuclear disarmament, material in excess of defense needs, and material in active and reserve stockpiles for military and naval propulsion.

Many developing countries are similarly suspicious of calls to strengthen the IAEA mandate, authority, and powers. Some IAEA members are concerned that incorporating a nuclear security budget into the regular budget while simultaneously freezing the regular budget will displace activities that are more important to them, including technical assistance. If we take this in conjunction with the effort to develop the so-called state-level approach to safeguards, it feeds into the wider debate: there is a risk that the IAEA is being reconfigured as an instrument to implement Western priorities (nonproliferation, counterterrorism) at the expense of global concerns (disarmament and development). Such concerns are not justified objectively: all the concerns that the IAEA is seeking to redress are genuinely global and should be shared by all members of the international community. To escape the trap of the sterile debate, David Santoro recommends the cultivation of “national security champions,” with in-depth understanding of the political, legal, economic, and technological aspects of the subject, as an effective means of fostering a culture of nuclear security at the national level.⁴⁴

The Government-Governance Gap

There is an unsustainable mismatch between the numbers and types of actors playing ever-expanding roles in civil, political, and economic affairs within and among nations, and the concentration of decision-making authority in intergovernmental institutions. Many grave threats are rooted in nonstate actors who are neither party nor subject to global regimes that are negotiated among governments. Like global governance in general, global nuclear governance is being increasingly shared among state, intergovernmental, and nonstate actors through standards and best practices that play complementary and parallel roles in ensuring security. A standard defines objectives; the IAEA’s Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5) is the primary nuclear security standards document. A best practice is a method or technique that produces results consistently superior to those obtained with other means.

Founded in Vienna in 2008, the World Institute for Nuclear Security (WINS) facilitates the sharing of information and experience among security professionals in the nuclear industry, promotes training and best practices, and develops peer-review systems. In consultation with industry and government stakeholders, WINS has developed more than 30 best practice guides.⁴⁵ These cover topics from nuclear security culture to threat assessment and effective security regula-

tion and implementation. WINS offers a peer-review mechanism for security management on a voluntary basis on request and is creating training programs for professional managers and operators of nuclear facilities and is thus creating “a community of practice” in nuclear security.⁴⁶

In the nuclear industry, there exists significant public-private crossownership, not just partnership. As commercial, nonproliferation, and nuclear security interests can overlap or collide between industry and government stakeholders, accountabilities in managing nuclear risks have to be shared between parliaments and boardrooms. Just as nuclear security events will add to the financial and commercial costs of the nuclear industry, so industry can help governments to reduce risks. Yet, at the Seoul National Security Summit, industry was given only a side event, even though Australia’s Prime Minister Julia Gillard did say that “we should find mechanisms to foster co-operation between governments and the private sector.”⁴⁷ This can be taken up even after the final summit in 2014. And it should be taken up, for nuclear security will remain fragile without the full and active involvement of the private-sector nuclear industry.

Conclusion

The nuclear security regime of agreements, regulations, resolutions, and guidelines either existed or were close to being finalized before 2010. It has made further progress in national implementation since being elevated to a leaders-level summit in 2010. National ratification of treaties and several projects were accelerated so they could be announced at the summits. But it still lags well behind the other nuclear regimes for safety, safeguards, and arms control. If a robust nuclear security culture is to be created, some issues will have to be addressed, including lack of universality, binding standards, transparency and accountability mechanisms, compulsory IAEA oversight, and broadened scope to include nuclear weapons and other noncivilian dimensions of the problem. The current regime relies almost entirely on national protection and control systems in those countries that possess nuclear and radiological materials. It needs to be more comprehensive instead of incremental, covering all materials and all facilities at all times; integrated rather than disparate and piecemeal; and backed by global mechanisms in order to make the regime both robust and resilient. The key to strengthening and improving the nuclear security regime is “balancing the principles of national sovereignty with international responsibility.”⁴⁸

Following from that, this analysis offers key recommendations for solving each of the four global governance disconnects. The global problems-sovereignty gap can be filled by reframing sovereignty from sacrosanct state privilege to shared responsibility for assuring nuclear

security along with other dimensions of collective and common security. The institutional gap can be addressed by empowering and adequately resourcing the IAEA. The efficiency-legitimacy disconnect can be rectified by brokering agreements, after the 2014 Netherlands Nuclear Security Summit, in other appropriate groupings like the G-8, BRICS, and, especially, the G-20, and then having these deals validated by the UN system as the mandated multilateral system. And the restrictive decision-making ambit of the mandated multilateral system in turn can be compensated by bringing national champions and civil society and private-sector actors into the consult-and-cooperate model of global governance rather than the command-and-control-by-government-fiat model.

Endnotes

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